What is claimed is:

1. A method of communicating over an optical network having a plurality of add/drop nodes interconnected by optical fiber, the method comprising:

producing a plurality of optical signals, including first and second optical signals;

pre-compensating the dispersion of the first and second signals by a similar magnitude and with the same sign;

transporting the first signal to a first drop location; and

transporting the second signal to a second drop location.

2. The method of claim 1 wherein the first and second optical signals are produced at a common source location.

3. The method of claim 1 wherein the first and second optical signals are produced at different source locations.

4. The method of claim 1 further comprising, after carrying the first and second signals to the respective first and second drop locations, post-compensating the first and second signals by a similar magnitude and with the same sign.

5. The method of claim 1 wherein the plurality of optical signals are produced at a plurality of source locations.

6. The method of claim 5 wherein greater than 25% of all of the optical signals produced are dispersion pre-compensated by a similar magnitude and with the same sign.

7. The method of claim 5 wherein greater than 50% of all of the optical signals produced are dispersion pre-compensated by a similar magnitude and with the same sign.

8. The method of claim 1 wherein the plurality of optical signals are produced at a common source location

9. The method of claim 8 wherein greater than 50% of the optical signals produced at the common source location are dispersion pre-compensated by a similar magnitude and with the same sign.

10. The method of claim 1 wherein the first and second signals temporally overlap.

11. A method of communicating over an optical network having a plurality of add/drop nodes interconnected by optical fiber, the method comprising:

producing a first second optical signal at a first source location;

producing a second optical signal at a second source location;

carrying the first and second signals to a common drop location; and

post-compensating the first and second signals by a similar magnitude and with the same sign.

12. The method of claim 11 further comprising, before carrying the first and second signals to a common drop location, pre-compensating the dispersion of the first and second signals by a similar magnitude and with the same sign.

13. The method of claim 11 wherein greater than 50% of all of the optical signals dropped are dispersion post-compensated by a similar magnitude and with the same sign.

14. The method of claim 11 wherein substantially all of the optical signals dropped are dispersion post-compensated by a similar magnitude and with the same sign.

15. The method of claim 11 wherein greater than 25% of the optical signals produced at the common source location are dispersion post-compensated by a similar magnitude and with the same sign.

16. The method of claim 11 wherein greater than 50% of the optical signals produced at the common source location are dispersion post-compensated by a similar magnitude and with the same sign.

17. An optical communications system comprising:

an optical signal source capable of generating a plurality of signals at a plurality of wavelengths, including first and second signals;

a plurality of nodes including first, second and third nodes;

a plurality of optical fiber links including:

interconnecting links that optically interconnect the plurality of nodes; and

external branch links, each external branch linkoptically connected to at least one of the nodes, including a first external branch link that optically connects the first node to the optical signal source; and

a signal dispersion pre-compensation means optically coupled to the first external branch link;

wherein the first and second signals are pre-compensated by a substantially similar magnitude and with the same sign prior to entering the first node;

wherein the first signal is added at the first node, then transported to and dropped at the second node; and

wherein the second signal is added at the first node, then transported to and dropped at the third node.

18. The method of claim 17 wherein the optical fiber span comprises at least one optical fiber section having a positive dispersion at a wavelength and at least one optical fiber section having a positive dispersion at the wavelength.

19. The method of claim 18 wherein the optical fiber span comprises optically coupled first, second and third optical fiber sections, the first optical fiber section having a dispersion of negative or positive sign at a wavelength, the second optical fiber section having a dispersion of opposite sign at the wavelength, and the third optical fiber section having a dispersion of like sign at the wavelength.

20. The method of claim 18 wherein the magnitude of the per span residual dispersion is greater than about 10 ps/nm.

21. The method of claim 18 wherein the magnitude of the per span residual dispersion is less than about 10 ps/nm.

22. The method of claim 17 wherein the first and second signals are pre-compensated to within 50 ps/nm of each other.

23. The method of claim 17 wherein at least one signal enters a first node, transits through a second node, and is dropped at a third node.

24. The method of claim 17 wherein greater than 50% of the signals generated by the optical signal source are each compensated with compensation having substantially similar magnitude and the same sign prior to entry into the first node.

25. The method of claim 17 further comprising at least one other external branch link optically coupled to one of nodes, wherein the first and second signals are post-compensated, with substantially magnitude and with the same sign, within the at least one other external branch links.

26. An optical communications system comprising:

a first optical signal source capable of generating a plurality of signals at a plurality of wavelengths including a first signal;

a second optical signal source capable of generating a plurality of signals at a plurality of wavelengths including a second signal;

a plurality of nodes including first, second and third nodes; and

a plurality of optical fiber links including:

interconnecting links that optically interconnect the plurality of nodes; and

external branch links, each external branch link optically connected to at least one of the nodes, including:

a first external branch link that optically connects the first node to the first optical signal source;

a second external branch link that optically connects the second node to the second optical signal source; and

a third external branch link optically connected to the third node;

wherein the first signal is added at the first node, then transported to and dropped at the third node;

wherein the second signal is added at the second node, then transported to and dropped at the third node; and

wherein the third external branch link includes signal dispersion post-compensation means for post-compensating the first and second signals with dispersion post-compensation of substantially similar magnitude and of the same sign.

27. The method of claim 26 wherein greater than 50% of the dropped signals are each post-compensated by a substantially similar magnitude and with the same sign.